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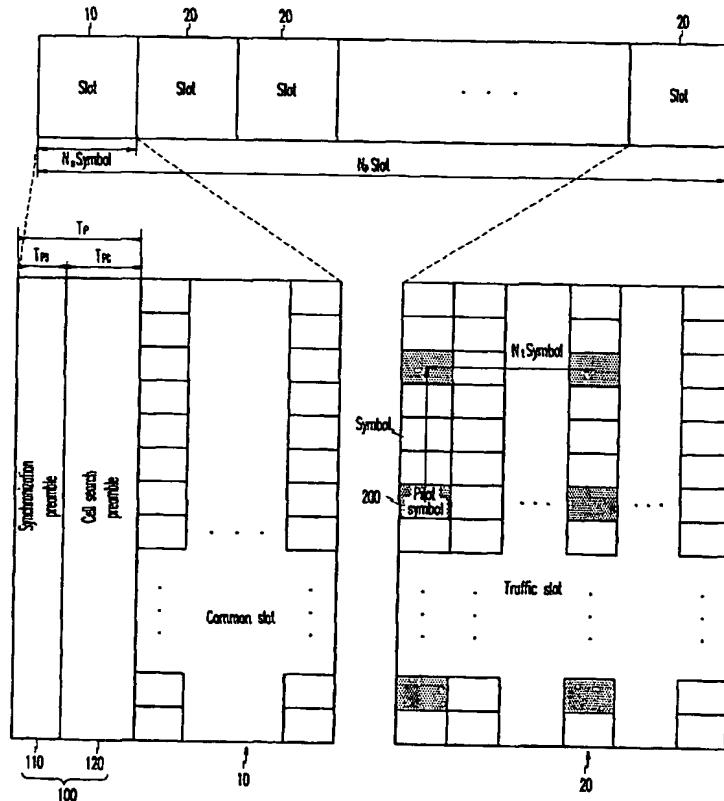
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(54) Title: **METHOD AND APPARATUS FOR EMBODYING AND SYNCHRONIZING DOWNLINK SIGNAL IN MOBILE COMMUNICATION SYSTEM AND METHOD FOR SEARCHING CELL USING THE SAME**



(57) Abstract: In an OFDMA-based cellular system, a frame of a downlink signal includes a common slot and traffic slots. The common slot includes a synchronization preamble and a cell search preamble. The synchronization preamble has a structure for synchronizing time and frequency, and the cell search preamble has a cell search structure. The traffic slot includes pilot symbols provided on the time and frequency axes. A cyclic prefix is used to estimate initial symbol synchronization, and the initial symbol synchronization and the synchronization preamble are used to synchronize the frame. The synchronization frame and the cell search preamble are used to estimate time and frequency synchronization. The cell search preamble is used to search cells. When the initial synchronization is performed, the cyclic prefix is used to track the frequency, the synchronization preamble is used to track symbol synchronization, and the cell search preamble is used to track fine frequency synchronization.



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